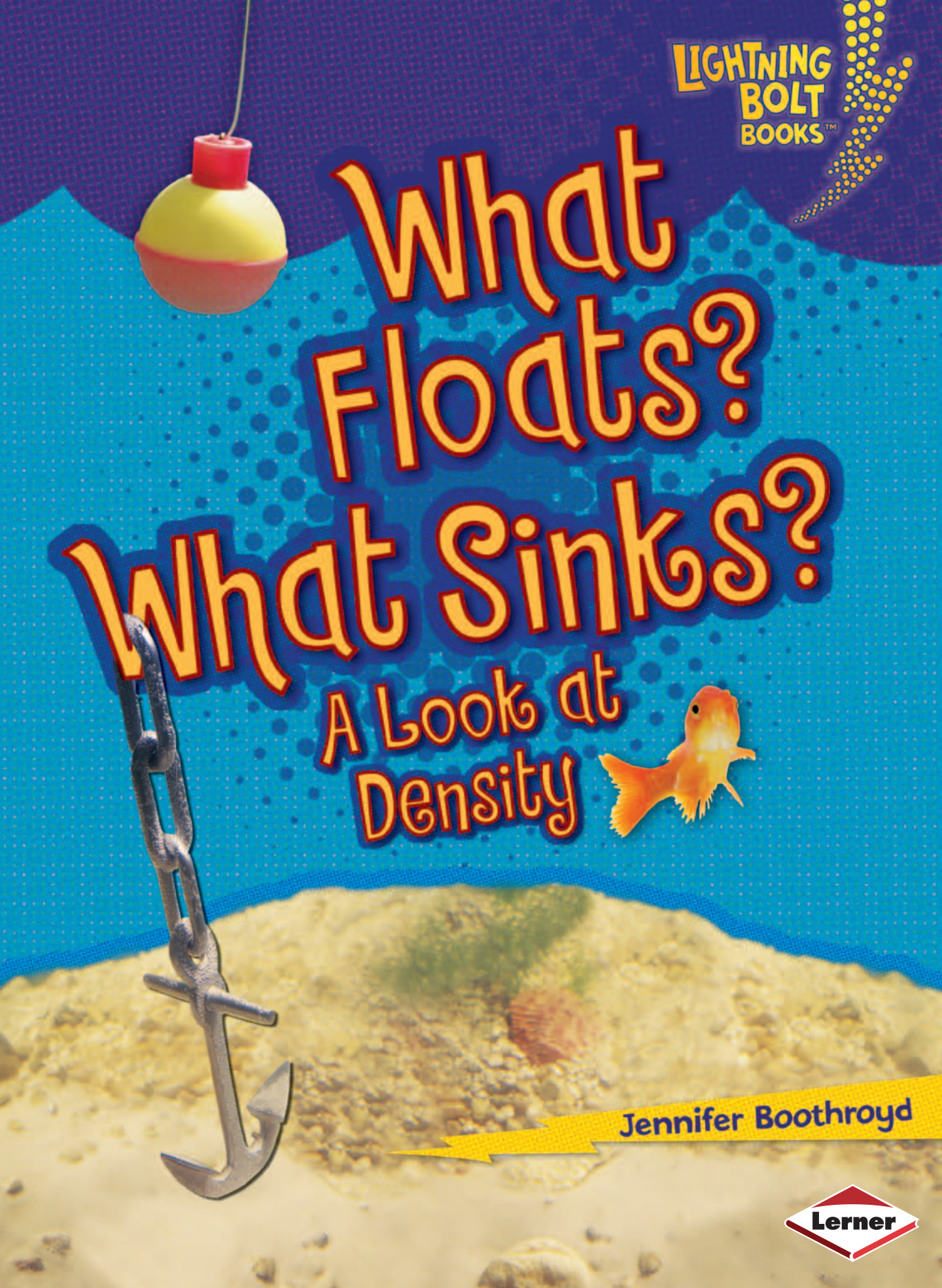
LIGHTNING BOLT BOOKS™
What Floats? What Sinks?
A Look at Density
Jennifer Boothroyd
Lerner

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LIGHTNING BOLT BOOKS™

What Floats? What Sinks?

A Look at Density

Jennifer Boothroyd

Lerner Publications Company
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To Dylan, Connor, and Riley

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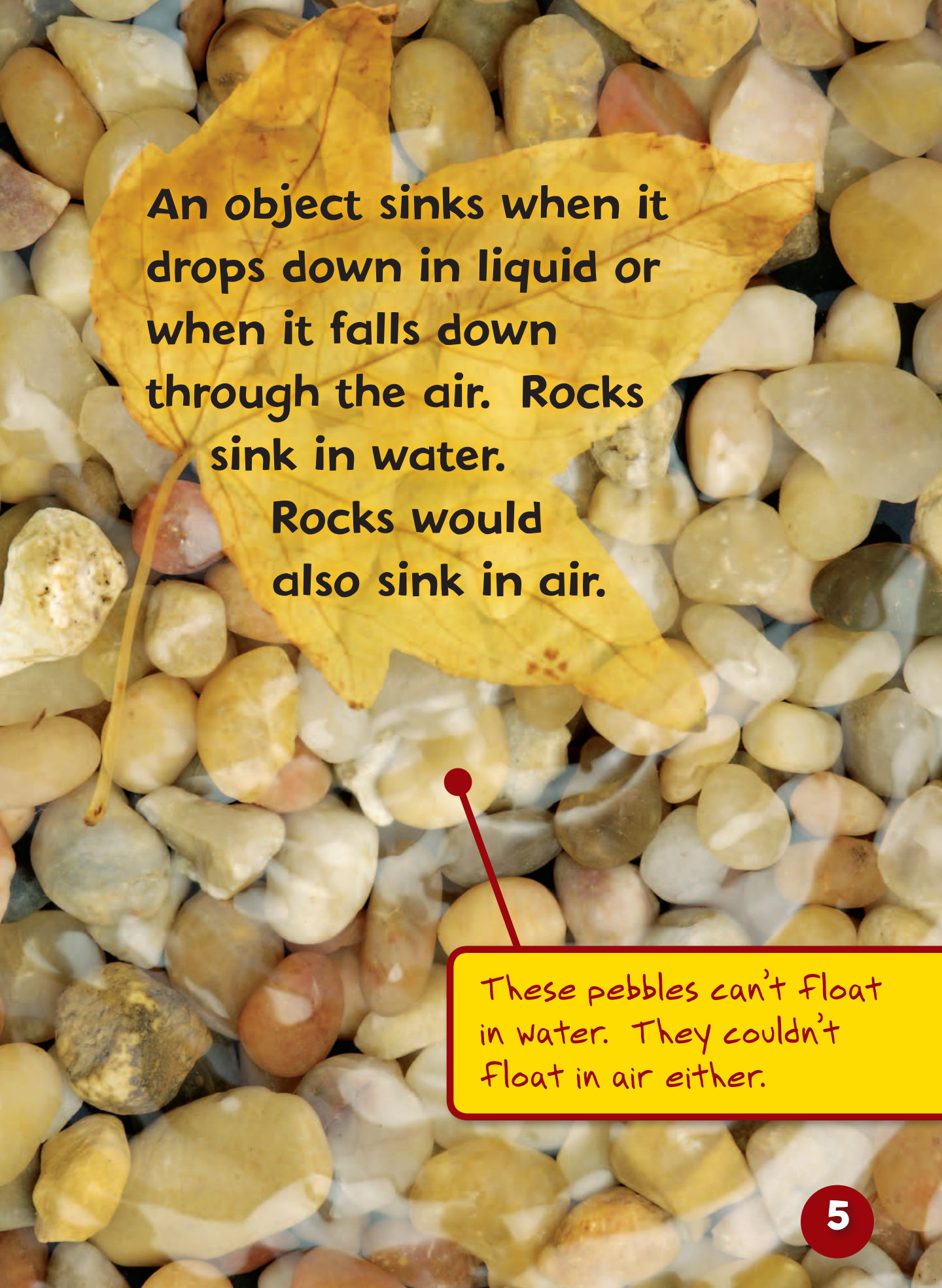
Contents

Floating and Sinking

An object floats when it rests on top of a liquid or when it rises in the air. Apples float in water. Hot air balloons float in the air.

Kids wash apples in a metal washtub. Notice that the apples are floating.



An object sinks when it drops down in liquid or when it falls down through the air. Rocks sink in water. Rocks would also sink in air.

These pebbles can't float in water. They couldn't float in air either.

Solid objects are not the only things that float and sink.
Liquids and gases do too.

A bubble is a liquid with gas inside it. Bubbles float.

Corn oil and syrup are both liquids. Corn oil floats in syrup.

Milk and chocolate sauce are liquids.

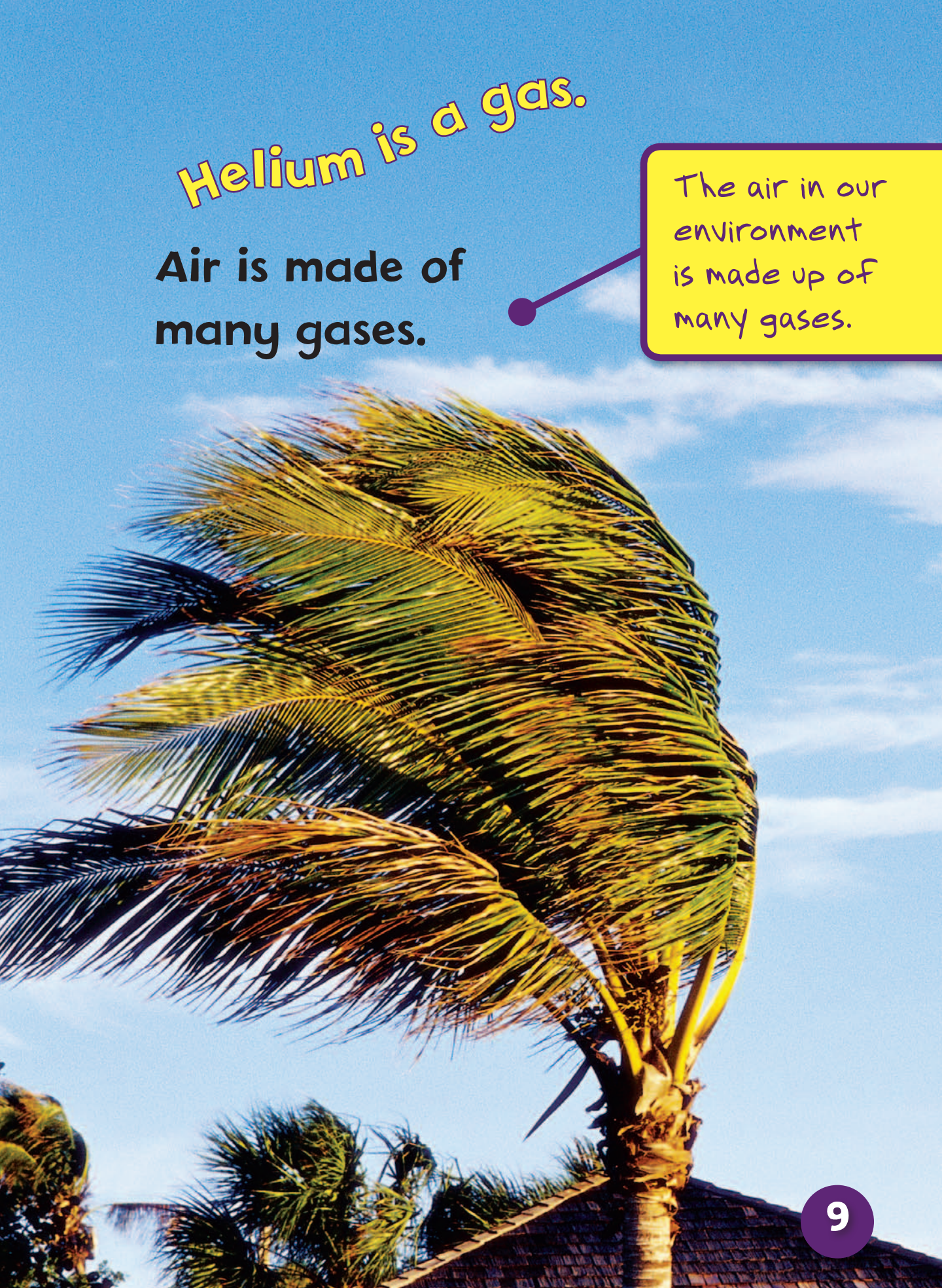
The sauce sinks in milk.

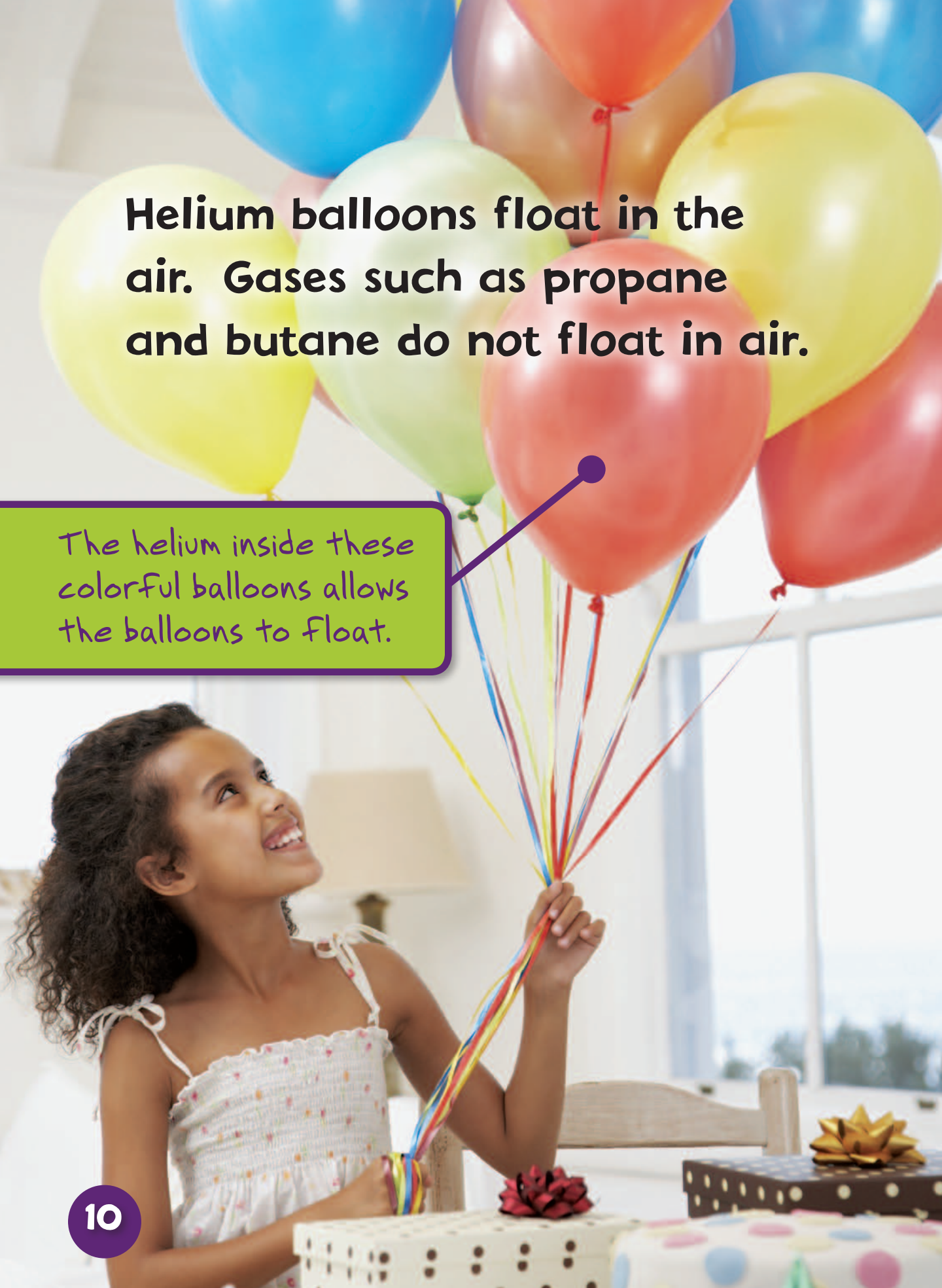
If you've ever poured chocolate sauce into milk, then you know that the sauce will sink.

Helium is a gas.

Air is made of many gases.

The air in our environment is made up of many gases.





Helium balloons float in the air. Gases such as propane and butane do not float in air.

The helium inside these colorful balloons allows the balloons to float.

Density

All solids, liquids, and gases have density. **Density is how heavy something is compared to its size.**

This ball is very dense. It isn't very big, but it's extremely heavy.

These candy treats are about the same size. One is solid chocolate. The other has a lot of air inside. The solid chocolate has more density.

The solid chocolate candy is heavier.

Objects sink if they have more density than the liquid or gas they are in.

Objects float if they have less density than the liquid or gas they are in.

This beach ball has less density than the water. The force of the water can hold up the ball.

Shape

An object's shape can make it sink or float too.

This swimmer can float when she stretches out on her back. A large part of her body is touching the water. More water can push against her.

This swimmer tucks in her arm and legs. She sinks to the bottom. The water can push against only a small part of her body.

This ship is very heavy.
Its shape helps it float in the ocean.

Ships like this one can weigh more than 60,000 tons (54,000 metric tons).

There are many rooms and open spaces in the ship. These spaces are filled with air. The air makes the ship less dense.

Ships sink if too much water comes inside. The water pushes out the air. The ship becomes denser.

The *Titanic* was a famous ship. It sank because it filled with too much water.

Water Level

Look where the water level is in this bowl.

Ice cubes float in water. Adding ice cubes makes the water level rise.

Rocks sink in water. Adding rocks makes the water level rise.

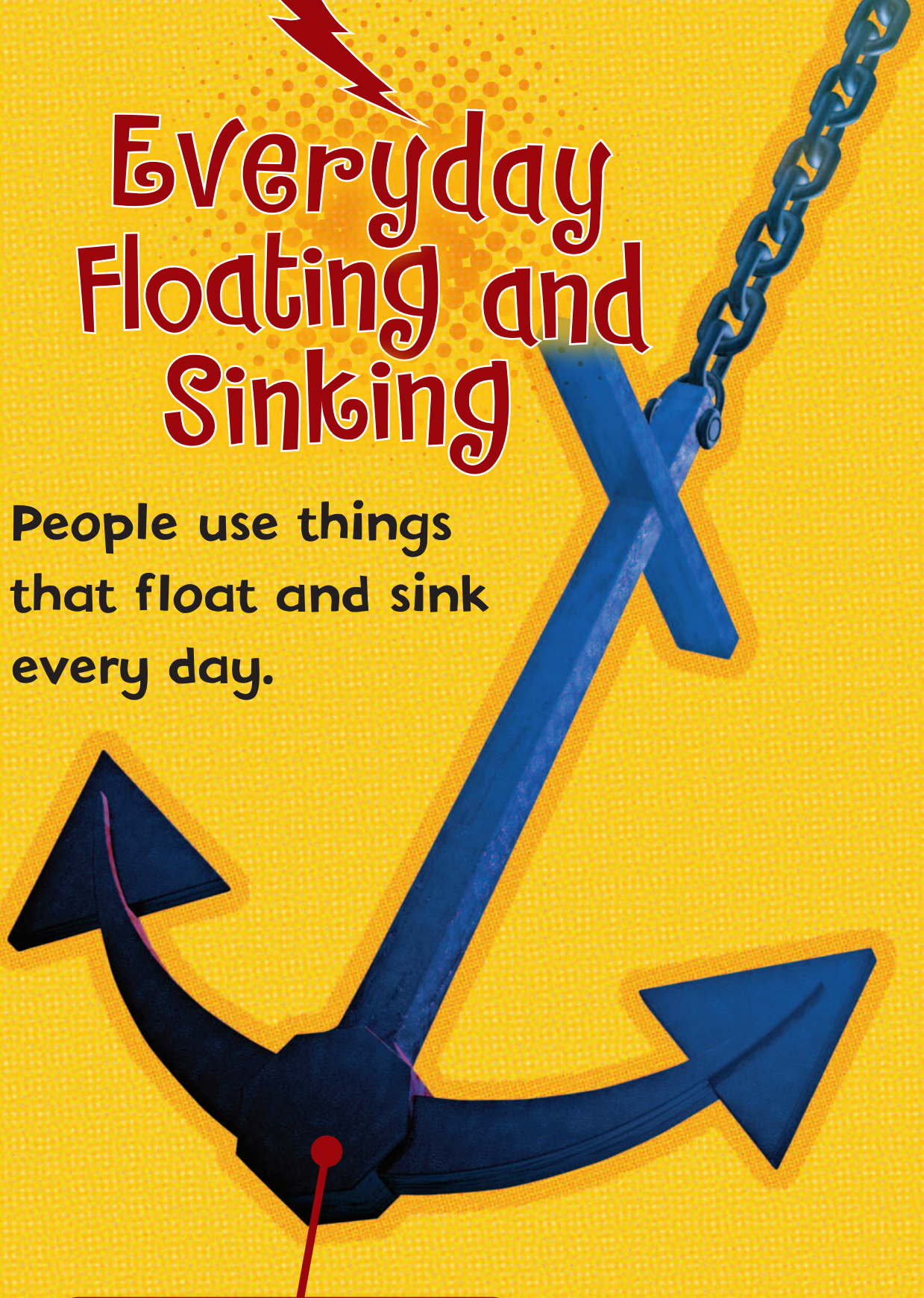
The water level was here before the rocks were added. Do you see how much higher it's risen?

When an object is in a liquid or a gas, the object pushes the liquid or the gas out of its way. This makes the level of the liquid or gas rise.

When these boys got in the tub, their bodies pushed the water out of their way. This made the tub's water level rise.

Everyday Floating and Sinking

People use things that float and sink every day.



Anchors like this one sink to the seafloor.


People use hooks when they go fishing.
A hook sinks to catch a fish.

People travel in a hot air balloon.

How is floating and sinking important to you?

Activity
Liquid Density

You can test the density of different objects compared to different liquids. Give this fun experiment a try.

What you need:

an adult to help you
two clear glasses of warm water, filled less than ¾ full
a clear glass of vegetable oil, filled less than ¾ full
a clear glass of syrup, filled less than ¾ full
3 teaspoons of salt
a spoon
four Ping-Pong balls

four golf balls
four grapes

What you do:

1. Line up the glasses of water, vegetable oil, and syrup.
2. With an adult's help, add the 3 teaspoons of salt to one of the glasses of water. Stir the salty water with the spoon.
3. Place one Ping-Pong ball in each of the glasses. Do they float or sink in the liquids? Remove the Ping-Pong balls.
4. Place one golf ball in each of the glasses. Do they float or sink in the liquids? Remove the golf balls.
5. Place one grape in each of the glasses. Do they float or sink in the liquids? Remove the grapes.

What did you learn from this experiment?

Glossary

density: how heavy something is compared to its size

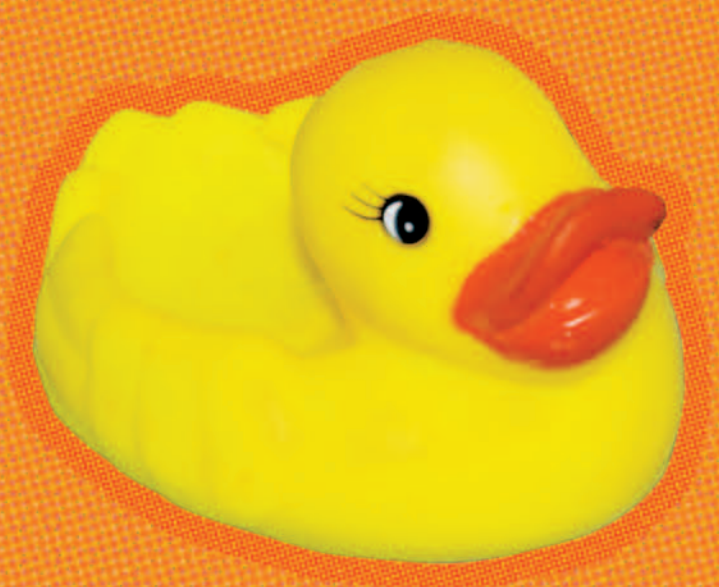
float: to rest on top of a liquid or to rise in the air

gas: a substance that will spread to fill any space that contains it

liquid: a wet substance that you can pour

sink: to drop down in liquid or to fall down through the air

solid: something that is firm and is neither a liquid nor a gas



Further Reading

Boat Safe Kids:
How Boats Float
http://boatsafe.com/kids/021598kidsques.htm

Digger and the Gang:
Into the Boat
http://www.bbc.co.uk/schools/digger/5_7entry/7.shtml

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NOVA: Buoyancy Basics
http://www.pbs.org/wgbh/nova/lasalle/buoybasics.html

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A rock sinks in the water. A hot air balloon floats in the air.

Many objects float and sink. But what makes them move this way? And how do people use floating and sinking in their lives? Read this book to find out!

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Exploring Physical Science

Attract and Repel: A Look at Magnets
Give It a Push! Give It a Pull!:
A Look at Forces
Many Ways to Move: A Look at Motion
What Floats? What Sinks?:
A Look at Density
What Holds Us to Earth?:
A Look at Gravity
Why Do Moving Objects Slow Down?:
A Look at Friction

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